

In the Claims

Please cancel claims 2, 9, 10-14, 19, 24-25, 28 and 36-44, without prejudice.

Please amend claims 1, 3, 7, 8, 17, 20, 21, 23, 26, 27, 29, 31 and 34 as follows:

1. (Amended) A resonant reflector for an optoelectronic device tuned to a wavelength, the resonant reflector comprising:

<sup>38</sup>  
a first material layer <sup>50</sup> having a thickness of an odd multiple of a quarter of the wavelength  
and also having a first refractive index, the first material layer having one or more patterned regions that extend down into the first material layer, selected patterned regions being filled with a second material <sup>10</sup> having a second refractive index, <sup>10</sup> the first refractive index being less than the second refractive index; and

a third layer positioned immediately adjacent the first material layer, the third layer having a third refractive index that is greater than the first refractive index.

<sup>39</sup>  
3. (Amended) A resonant reflector according to claim 1, wherein the second material also extends above the non-patterned regions of the first material layer.

<sup>40</sup>  
<sup>41</sup>  
7. (Amended) A resonant reflector according to claim 1, wherein the first material is SiO<sub>2</sub>, the second material is Si<sub>3</sub>N<sub>4</sub> or TiO<sub>2</sub>, and the third layer is AlGaAs.

<sup>42</sup>  
<sup>43</sup>  
8. (Amended) A resonant reflector according to claim 1 wherein the first material layer is a top mirror layer of a DBR mirror.

<sup>44</sup>  
<sup>45</sup>  
<sup>46</sup>  
17. (Amended) A resonant reflector according to claim 16, wherein the one or more patterned regions provide a phase shift relative to the non-patterned regions.

20. (Amended) A resonant reflector for an optoelectronic device, the resonant reflector comprising:

*B3*  
a top mirror with a top mirror layer, the top mirror layer etched with a pattern down but not through the top mirror layer resulting in one or more patterned regions and one or more non-patterned regions, wherein the one or more patterned regions reduce the reflectivity of the resonant reflector in those regions;

a cap mirror situated above selected non-patterned regions of the top mirror layer.

21. (Amended) A resonant reflector according to claim 20, wherein the one or more patterned regions provide a phase shift relative to the non-patterned regions.

23. (Amended) A resonant reflector for an optoelectronic device that has an optical cavity with an optical axis, the resonant reflector comprising:

*B4*  
a resonant reflector layer extending across at least part of the optical cavity of the optoelectronic device, the resonant reflector layer having a refractive index that does not abruptly change laterally across the optical cavity;

the refractive index of the resonant reflector layer including contributions from a first material having a first refractive index and a second material having a second refractive index, at least one of the first material and the second material being a polymer.

*B5*  
26. (Amended) A resonant reflector according to claim 23, wherein the first material is confined to a first region and the second material is confined to a second region, the

first region and the second region co-extending along an interface, wherein at least part of the interface is not parallel to the optical axis of the optoelectronic device.

*B15*

27. (Amended) A resonant reflector according to claim 23, wherein the first refractive index is less than the second refractive index.

*B16*

29. (Amended) A resonant reflector according to claim 23, wherein the first material is AlGaAs and the second material is a polymer.

*B17*

31. (Amended) A resonant reflector according to claim 23, further comprising a mirror having a top mirror layer, the top mirror layer positioned adjacent to the resonant reflector layer.

*B18*

34. (Amended) A resonant reflector for an optoelectronic device that has an optical cavity with an optical axis, the resonant reflector comprising:

a resonant reflector layer having two substantially planar opposing surfaces extending across at least part of the optical cavity of the optoelectronic device, the resonant reflector layer having a first region with a first refractive index and a second region with a second refractive index, the first region and the second region co-extending along an interface, at least part of the interface being not parallel to the optical axis.

Remarks

The preceding amendment and following remarks are submitted in response to the Office Action of the Examiner mailed August 30, 2002, setting a three-month shortened statutory period